

B<sup>2</sup>

In the FPD protecting film the surface of the film body 14a is coated with the fluoride layer 14b, and thus MgO or the like in the film body 14a little reacts with CO<sub>2</sub> gas and H<sub>2</sub>O gas in air even when the protecting film 14 is exposed to air for a long time in the process for manufacturing FPD 10 (refer to Fig. 2). As a result, MgO or the like in the film body 14a is little degenerated to MgCO<sub>3</sub> and Mg(OH)<sub>2</sub> which possibly deteriorate the function of the FPD 10.

✓ Please replace the paragraph on page 8, line 3 from the bottom through page 9, line 7 with the following paragraph.

B<sup>3</sup>

In accordance with the present invention, as shown in Figs. 3 and 4, a FPD protecting film comprises a film body 34a formed on a substrate 13 and made of any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides, wherein the film body 34a is formed by using a fluoride layer-coated powder of any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides.

✓ Please replace the paragraph on page 9, lines 8-20 with the following paragraph.

B<sup>4</sup>

In the FPD protecting film the surfaces of MgO powder particles or the like are coated with fluoride layers, and thus MgO or the like in the film body 34a little reacts with CO<sub>2</sub> gas and H<sub>2</sub>O gas in air even when the protecting film 34 is exposed to air in the manufacturing process (refer to Fig. 4). As a result, MgO or the like in the film body 34a is little degenerated to MgCO<sub>3</sub>, Mg(OH)<sub>2</sub>, etc. having the probability of deteriorating the function of FPD 10. Since the fluoride layers coated on the surfaces of MgO powder or the like are very thin, the mechanical characteristics of the MgO powder or the like are substantially the same as a MgO powder or the like with no fluoride layer coated on the surfaces thereof.

✓ Please replace the paragraph on page 10, lines 10-17 with the following paragraph.

B5  
In accordance with the present invention, a method of producing a FPD protecting film comprises forming a film body 14a on a substrate 13 by using any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides; and treating the surface of the film body with a gaseous fluorinating agent to form a fluoride layer 14b on the surface of the film body 14a, as shown in Figs. 1 and 2.

✓ Please replace the paragraph on page 10, lines 18-24 with the following paragraph.

B6  
In the method of producing a FPD protecting film, MgO or the like in the film body 14a is little degenerated to  $\text{MgCO}_3$  and  $\text{Mg(OH)}_2$  which are harmful to the function of the FPD 10 (refer to Fig. 2), thereby shortening the time of the subsequent degassing step for removing  $\text{MgCO}_3$  and  $\text{Mg(OH)}_2$  or omitting the subsequent degassing step.

✓ Please replace the paragraph on page 10, last line through page 11, line 7 with the following paragraph.

B7  
In accordance with the present invention, a method comprises forming a film body 14a on a substrate 13 in a vacuum, and treating the surface of the film body 14a with a gaseous fluorinating agent in a vacuum or an inert gas atmosphere without exposing the film body 14a to air to form a fluoride layer 14b on the surface of the film body 14a, as shown in Figs. 1 and 2.

✓ Please replace the paragraph on page 11, line 8-15 with the following paragraph.

B8  
In the method of producing a FPD protecting film, after the film body 14a is formed on the surface of the substrate 13, the film body 14a is not exposed to air before the fluoride layer 14b is formed on the surface of the film body 14a, thereby preventing or suppressing the production of carbonate ( $\text{MgCO}_3$ , or the like) and hydroxide ( $\text{Mg(OH)}_2$ , or the like) of MgO, which are harmful to the FPD, on the surface of the film body 14a.

Please replace the paragraph on page 11, lines 16-23 with the following paragraph.

B9  
In accordance with the present invention, a method comprises forming a film body 14a on a substrate 13 in a vacuum, burning the film body 14a in air after exposing the film body 14a to air to activate the film body 14a, and treating the surface of the film body 14a with a gaseous fluorinating agent to form a fluoride layer 14b on the surface of the film body 14a, as shown in Figs. 1 and 2.

Please replace the paragraph on page 11, line 2 from the bottom through page 12, line 12 with the following paragraph.

B10  
In the method of producing a FPD protecting film, after the film body 14a is formed on the surface of the substrate 13, the film body 14a is exposed to air and burned in air to be activated. Therefore, even when carbonate ( $\text{MgCO}_3$ , or the like) and hydroxide ( $\text{Mg(OH)}_2$ , or the like) of MgO, which are harmful to the FPD, are formed on the surface of the film body 14a, the carbonate ( $\text{MgCO}_3$ , or the like) and hydroxide ( $\text{Mg(OH)}_2$ , or the like) of MgO are removed as  $\text{CO}_2$  and  $\text{H}_2\text{O}$  by burning in air. In this state, the fluoride layer 14b is formed on the surface of the film body 14a to protect the surface of the film body 14a by the fluoride layer 14b, thereby preventing and suppressing the formation of carbonate ( $\text{MgCO}_3$ , or the like) and hydroxide ( $\text{Mg(OH)}_2$ , or the like) of MgO.

Please replace the paragraph on page 12, lines 13-17 with the following paragraph.

B11  
In accordance with the present invention, a method further comprises activating the film body 14a before, during or after the substrate 13 on which the film body 14a and the fluoride layer 14b are formed is assembled into a panel.

Please replace the paragraph on page 12, lines 18-25 with the following paragraph.

B12  
In the method of producing a FPD protecting film, since the film body 14a is activated by burning after the fluoride layer 14b is formed on the surface of the film body 14a, even

B12  
C12

when hydroxide ( $\text{Mg}(\text{OH})_2$ , or the like) of  $\text{MgO}$  or the like is formed a little on the film body 14a, the hydroxide can be removed as  $\text{H}_2\text{O}$ , thereby decreasing the rate of recontamination of the film body 14a with atmospheric moisture.

✓ Please replace the paragraph on page 13, lines 1-16 with the following paragraph.

B13

In accordance with the present invention, a method of producing a FPD protecting film comprises treating, with a gaseous fluorinating agent, the surfaces of a powder of any one of  $\text{MgO}$ ,  $\text{CaO}$ ,  $\text{SrO}$ ,  $\text{BaO}$ , alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides to coat fluoride layers on the powder surfaces of any one of  $\text{MgO}$ ,  $\text{CaO}$ ,  $\text{SrO}$ ,  $\text{BaO}$ , alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides; mixing a binder, a solvent and the fluoride layer-coated powder of any one of  $\text{MgO}$ ,  $\text{CaO}$ ,  $\text{SrO}$ ,  $\text{BaO}$ , alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides to prepare paste or a dispersion for a film; and forming a film body 34a on the surface of a substrate 13 by using the paste or dispersion for a film, as shown in Figs. 3 and 4.

✓ Please replace the paragraph on page 13, lines 17-24 with the following paragraph.

B14

In the method of producing a FPD protecting film, since  $\text{MgO}$  or the like in the film body 34a is little degenerated to  $\text{MgCO}_3$ ,  $\text{Mg}(\text{OH})_2$ , etc. harmful to the function of the FPD 10 (refer to Fig. 4), it is possible to shorten the time of the subsequent degassing step for removing the  $\text{MgCO}_3$ ,  $\text{Mg}(\text{OH})_2$ , etc., or omitting the subsequent degassing step, thereby decreasing the manufacturing cost of the FPD 10.

✓ Please replace the paragraph on page 13, last line through page 14, line 8 with the following paragraph.

B15

In the method according to the present invention, the film body 14a made of any one of  $\text{MgO}$ ,  $\text{CaO}$ ,  $\text{SrO}$ ,  $\text{BaO}$ , alkali earth compound oxides, rare earth oxides, and compound

B13  
cancel

oxides of alkali earth oxides and rare earth oxides, or the powder of any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides is preferably surface-treated with the gaseous fluorinating agent under pressure of 1 to 760 Torr.

✓ Please replace the paragraph on page 14, lines 9-12 with the following paragraph.

B14

In the method, as the gaseous fluorinating agent, any one of fluorine gas, hydrogen fluoride gas,  $\text{BF}_3$ ,  $\text{SbF}_5$ , and  $\text{SF}_4$ , particularly fluorine gas or hydrogen fluoride gas, is preferably used.

✓ Please replace the paragraph on page 14, lines 13-17 with the following paragraph.

B17

A powder of any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides is coated with a fluoride layer in order to form a FPD protecting film 34.

✓ Please replace the paragraph on page 14, lines 18-20 with the following paragraph.

B18

The thickness of the fluoride layer coated on the powder is preferably 0.1 to 1000 nm.

✓ Please replace the paragraph on page 14, line 19 through page 15, line 1 with the following paragraph.

B19

The paste for a film is prepared by mixing a binder, a solvent, and the fluoride layer-coated powder of any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides.

✓ Please replace the paragraph on page 15, lines 2-7 with the following paragraph.

B20

The dispersion for a film is prepared by mixing a binder, a solvent, and the fluoride layer-coated powder of any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides.

✓ Please replace the paragraph on page 15, lines 8-10 with the following paragraph.

B21  
The use of the paste or dispersion for a film containing the fluoride layer-coated powder permits easy formation of a film body.

✓ Please replace the paragraph on page 15, lines 11-12 with the following paragraph.

B22  
The FPD uses a protecting film.

✓ Please replace the paragraph on page 15, lines 15-17 with the following paragraph.

B23  
The FPD of the present invention permits a significant decrease in number of steps for manufacturing FPD, and manufacture at low cost.

✓ Please replace the paragraph on page 15, line 18 through page 16, line 2 with the following paragraph.

B24  
In accordance with the present invention, a method of producing a FPD protecting film comprises forming, on the surface of a substrate 13, a protecting film 54 made of any one of alkali earth metal oxides, alkali earth metal compound oxides, rare earth metal oxides, and compound oxides of alkali earth metals and rare earth metals treating the surface of the protecting film 54 with a gaseous fluorinating agent to form a fluoride layer 55 on the surface of the protecting film 54; and then removing the fluoride layer 55 after FPD is assembled by using the substrate 13, as shown in Fig. 5.

✓ Please replace the paragraph on page 16, lines 3-20 with the following paragraph.

B25  
In the method of producing a FPD protecting film, the protecting film 54 is reacted directly with the gaseous fluorinating agent to form the fluoride layer 55 on the surface of the protecting film 54, thereby coating the surface of the protecting film 54 with the fluoride layer 55. Therefore, even when the protecting film 54 is exposed to air for a long time during the process for manufacturing the FPD 10, the protecting film 54 little reacts with CO<sub>2</sub> gas and water vapor in air. As a result, the protecting film 54 is little degenerated to a carbonate, a hydroxide, etc., of an alkali earth metal oxide or the like, which have the probability of

B25  
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deteriorating the function of the FPD 10. On the other hand, it is possible to prevent the occurrence of cracking in the fluoride layer 55 and separation thereof because of good matching between the fluoride layer 55 and the protecting film 54, thereby improving the degeneration protecting effect of the protecting film 54.

✓ Please replace the paragraph on page 17, lines 10-13 with the following paragraph.

B26

In accordance with the present invention, the FPD protecting film 54 is produced as shown in Fig. 5.

✓ Please replace the paragraph on page 17, lines 14-16 with the following paragraph.

B27

The FPD 10 uses the protecting film 54 as shown in Fig. 5(d).

✓ Please replace the paragraph on page 17, lines 17-20 with the following paragraph.

B28

In the FPD protecting film 54, the fluoride layer 55 is removed after assembly of the FPD 10, thereby improving discharge characteristics of the FPD 10.

✓ Please replace the paragraph on page 37, line 14 through page 38, line 9 with the following paragraph.

B29

Next, sintered pellets of an alkali earth metal oxide or the like (for example, MgO), which has a purity of 99.5% or more, are deposited by vaporization such as electron beam evaporation or the like to cover the surface of the transparent dielectric layer 17 of the glass substrate 13, to form the protecting film 54 (Fig. 5(a)). Deposition conditions of the protecting film 54 preferably include an acceleration voltage of 5 to 30 kV, a deposition pressure of  $0.1 \times 10^{-2}$  to  $10 \times 10^{-2}$  Pa, and a deposition distance of 100 to 1000 nm. The front glass substrate 13 is further maintained in an atmosphere of a gaseous fluorinating agent (temperature 10 to 100°C) for 0.1 to 120 minutes to modify the surface of the protecting film 54, to form the fluoride, layer 55 on the surface of the protecting film 54 (Fig. 5(b)). The pressure of the gaseous fluorinating agent is preferably set in the range of 1 to 760 Torr, more